

B.Sc. Hons. Electronic Science

PROGRAM OUTCOMES

❖ Learning outcomes-based approach to curriculum planning and development

The learning outcomes based approach implies that when an academic programme is planned, desirable learning outcomes are identified and considered in formulation of the plans. Course contents, learning activities and assessment types are designed to be consistent with the achievement of desired learning outcomes. The learning outcomes are in terms of knowledge, Professional attitude, work ethics, critical thinking, self managed learning, adaptability, problem solving skills, communication skills, interpersonal skills and group work. At the end of a particular course/program, assessment is carried out to determine whether the desired outcomes are being achieved. This outcome assessment provides feedback to ensure that elements in the teaching and learning environment are acting in concert to facilitate the nurturing of the desired outcomes. The expected learning outcomes are used as reference points that would help formulate graduate attributes, qualification descriptors, programme learning outcomes and course learning outcomes which in turn help not only in curriculum planning and development, but also in delivery and review of academic programmes.

The overall objectives of the learning outcomes based curriculum framework are:

- Help formulate graduate attributes, qualification descriptors, program learning outcomes and course learning outcomes that are expected to be demonstrated by the holders of qualification.
- Enable prospective students, parents, employers and others to understand the nature and level of learning outcomes or attributes a graduate of a programme should be capable of demonstrating on successful completion of the programme of study.
- Maintain national standards and international comparability of learning outcomes and academic standards to ensure global competitiveness, and to facilitate student/graduate mobility.
- Provide higher education institutions an important point of reference for designing teaching-learning strategies, assessing student learning level, and periodic review of programme and academic research.

❖ Nature and Extent of B.Sc. (Hons.) Electronic Science

B.Sc. (Hons) Electronic Science is a professional program which needs to develop a specialized skill set among the graduates to cater the need of industries. In recent years, Electronic Science has made unprecedented growth in terms of new technologies, new ideas and principles. The research organizations and industries that work in this frontier area are in need of highly skilled and scientifically oriented manpower. This manpower can be available only with flexible, adaptive and progressive training programs and a cohesive interaction among the research organizations, academicians and industries. The key areas of study within subject area of Electronic Science comprise: Semiconductor Devices, analog and digital circuit design,

Microprocessors & Microcontroller systems, Communication techniques, IoT and computation techniques for Electronics, computer coding/programming in high level languages etc.

B.Sc. (Hons) Electronic Science covers topics that overlap with areas outlined above and with applied fields such as embedded system, advanced computer and data communication, robotics, control systems, VLSI Design and Fabrication, Nanoelectronics, Artificial Intelligence, Internet of Things etc.

The present learning outcomes based model curriculum of B.Sc. (Hons) Electronic Science, is designed to provide better learning experience to the graduates. Besides, imparting disciplinary knowledge, curriculum is aimed to equip the graduates with competencies like problem solving, analytical reasoning and leadership which provide them high professional competence.

❖ **Aims of the Bachelor's Degree Programme**

The overall aims of the B.Sc. (Hons) Electronic Science are:

- Provide students with learning experiences that develop broad knowledge and understanding of key concepts of electronic science and equip students with advanced scientific/technological capabilities for analyzing and tackling the issues and problems in the field of electronics.
- Develop ability in student's to apply knowledge and skills they have acquired to the solution of specific theoretical and applied problems in electronics.
- Develop abilities in students to design and develop innovative solutions for benefits of society, by diligence, leadership, teamwork and lifelong learning.
- Provide students with skills that enable them to get employment in industries or pursue higher studies or research assignments or turn as entrepreneurs.

❖ **Graduate Attributes**

Graduates Attributes (GAs) form a set of individually assessable outcomes that are the components indicative of the graduate's potential to acquire competence to practice at the appropriate level. The Graduate Attributes of B.Sc. (Hons) Electronic Science are listed below:

Scholarship of Knowledge:

Acquire in-depth knowledge of specific discipline or professional area, including wider and global perspective, with an ability to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge.

Critical Thinking:

Analyze complex scientific/technological problems critically; apply independent judgment for synthesizing information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context.

Problem Solving:

Think laterally and originally, conceptualize and solve scientific/technological problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors in the core areas of expertise.

Usage of modern tools:

Create, select, learn and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex scientific/technological activities with an understanding of the limitations.

Collaborative and Multidisciplinary work:

Possess knowledge and understanding of group dynamics, recognize opportunities and contribute positively to collaborative multidisciplinary scientific research, demonstrate a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis in order to achieve common goals and further the learning of themselves as well as others.

Communication:

Communicate with the scientific/technological community, and with society at large, regarding complex scientific/technological activities confidently and effectively, such as, being able to comprehend and write effective reports and design documentation by adhering to appropriate standards, make effective presentations, and give and receive clear instructions.

Life-long Learning:

Recognize the need for, and have the preparation and ability to engage in life-long learning independently, with a high level of enthusiasm and commitment to improve knowledge and competence continuously.

Ethical Practices and Social Responsibility:

Acquire professional and intellectual integrity, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

❖ Programme Specific Outcomes

The following program specific outcomes have been identified for B.Sc. (Hons) Electronic Science:

- Ability to apply knowledge of mathematics & science in solving electronics related problems.

- Ability to design and conduct electronics experiments, as well as to analyze and interpret data.
- Ability to design and manage electronic systems or processes that conforms to a given specification within ethical and economic constraints.
- Ability to identify, formulate, solve and analyze the problems in various disciplines of electronics.
- Ability to function as a member of a multidisciplinary team with a sense of ethics, integrity and social responsibility.
- Ability to communicate effectively in terms of oral and written communication skills.
- Recognize the need for, and be able to engage in lifelong learning.
- Ability to use techniques, skills and modern technological/scientific/engineering software/tools for professional practices